

What is claimed is:

1. A picture inputting apparatus comprising:  
a solid state image pickup device having a  
5 high-resolution pixel array consisting of a  
plurality of photo-receptive elements disposed  
at a high density for converting a formed image  
into a pixel value of an electric signal by  
photoelectric conversion;  
10 a low-resolution whole picture scanning unit  
which outputs low-resolution whole picture data  
by reading out and scanning the wholeness of an  
imaging range with the pixel array resolution  
lowered;  
15 a high-resolution partial picture scanning  
unit which outputs high-resolution partial  
picture data by partially reading out and scanning  
the imaging range with the pixel array  
high-resolution kept;  
20 a switching unit which provides a switching  
between the low-resolution whole picture scanning  
unit and the high-resolution partial picture  
scanning unit within a predetermined frame period  
to thereby output in sequence the low-resolution  
25 whole picture data and the high-resolution partial  
image data at a speed equal to or greater than  
the video rate; and

an image processing unit which automatically determines the extracting position of the high-resolution partial picture at the next frame, based on the low-resolution whole picture data  
5 output from the low-resolution whole picture scanning unit, to thereby instruct the high-resolution partial picture scanning unit on the extracting position.

10 2. The picture inputting apparatus according to claim 1, further comprising:

a low-resolution whole picture accumulation unit which accumulates the low-resolution whole picture data output as a result of readout scanning  
15 of the pixel array;

a whole picture data transmission unit which reads out images accumulated in the low-resolution whole picture accumulation unit to shape the low-resolution whole picture data into a single  
20 piece of picture data in a predetermined format, for the output to the outside;

a high-resolution partial picture accumulation unit which accumulates the high-resolution partial picture data output as  
25 a result of the readout scanning of the pixel array; and

a partial picture data transmission unit

which reads out images accumulated in the high-resolution partial picture accumulation unit to shape the high-resolution partial picture data into a single piece of picture data in a predetermined format, for the output to the outside.

3. The picture inputting apparatus according to claim 1, wherein

10 the solid state image pickup device includes:  
a plurality of photo-receptive elements which are two-dimensionally arranged in  $N_1$  rows and  $N_2$  columns;

a column selection line and a row selection  
15 line which select individually the plurality of photo-receptive elements to allow output of a pixel value;

two output lines disposed at each of the plurality of photo-receptive elements; and

20 a plurality of filters which calculate and output the sum or the mean value by connecting to their respective inputs one output lines of the photo-receptive elements on an  $n_1$  rows and  $n_2$  columns pixel basis where  $n_1$  and  $n_2$  are integers  
25 obtained by dividing high-resolution  $N_1$  rows and  $N_2$  columns by low-resolution  $m_1$  rows and  $m_2$  columns, respectively, where the pixel count of the  $N_1$  rows

and  $N_2$  columns provides a high-resolution picture while the pixel count of  $m_1$  rows and  $m_2$  columns less than the pixel count of the  $N_1$  rows and  $N_2$  columns provides a low-resolution picture,

5 wherein

the low-resolution whole picture scanning unit collectively selects the photo-receptive elements for each  $n_1$  rows and  $n_2$  columns for each of the plurality of filters and simultaneously  
10 allows filter outputs of  $m_1$  rows and  $m_2$  columns to be output in the form of low-resolution whole picture signals, and wherein

the high-resolution partial picture scanning unit scans the photo-receptive elements  
15 in  $k_1$  rows and  $k_2$  columns which are designated as the extracting position within the  $N_1$  rows and  $N_2$  columns to allow pixel values to be output as high-resolution partial picture signals from the other output lines.

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4. The picture inputting apparatus according to claim 1, wherein

the solid state image pickup device includes:  
a plurality of photo-receptive elements  
25 which are two-dimensionally arranged in  $N_1$  rows and  $N_2$  columns; and

a column selection line and a row selection

line which select individually the plurality of photo-receptive elements to allow output of a pixel value, wherein

the low-resolution whole picture scanning unit allows output of low-resolution whole picture signals while thinning out pixel values for each  $n_1$  rows and  $n_2$  columns where  $n_1$  and  $n_2$  are integers obtained respectively by dividing high-resolution  $N_1$  rows and  $N_2$  columns respectively by low-resolution  $m_1$  rows and  $m_2$  columns, where the pixel count of the  $N_1$  rows and  $N_2$  columns provides a high-resolution picture while the pixel count of  $m_1$  rows and  $m_2$  columns less than the pixel count of the  $N_1$  rows and  $N_2$  columns provides a low-resolution picture, and wherein

the high-resolution partial picture scanning unit scans the photo-receptive elements in  $k_1$  rows and  $k_2$  columns which are designated as the extracting position within the  $N_1$  rows and  $N_2$  columns to allow pixel values to be output as high-resolution partial picture signals.

5. The picture inputting apparatus according to claim 3 or 4, wherein

the low-resolution whole picture scanning unit and the high-resolution partial picture

scanning unit perform readout scanning such that the low-resolution whole picture and the high-resolution partial picture have the same pixel size.

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6. The picture inputting apparatus according to claim 3 or 4, wherein the low-resolution whole picture scanning unit and the high-resolution partial picture scanning unit perform readout scanning such that the low-resolution whole picture and the high-resolution partial picture have the same pixel size which is expressed by a matrix of 512 × 480 pixels in NTSC, 768 × 576 pixels in PAL or 640 × 480 pixels in VGA.

7. The picture inputting apparatus according to claim 1, wherein

20 the image processing unit includes:  
an object region extraction unit which extracts a changed object region and an unchanged non-object region based on the difference of pixels between low-resolution whole picture data of the current frame and background picture data of the last frame;

a background picture updating unit which adds

the unchanged non-object region to the background picture data, for updating;

a noted position detection unit which selects an undetected noted object through the comparison  
5 of the object region data with detected object data of the last frame, to determine a noted position, the noted position detection unit adding the selected noted object to the detected object data, for updating; and

10 an extracting position determination unit which predicts a noted position of the next frame based on a motion model obtained from the frame history of the noted position of the selected noted object, to determine a picture extracting position  
15 of the next frame.

8. The picture inputting apparatus according to claim 1, wherein

the image processing unit automatically .  
20 determines the extracting position of a high-resolution picture at the next frame based on the high-resolution partial picture data in addition to the low-resolution whole picture data and instructs the high-resolution partial picture  
25 scanning unit on the determined extracting position.

9. The picture inputting apparatus according to

claim 6, wherein

the image processing unit includes:

5 an object region extraction unit which extracts a changed object region and an unchanged non-object region based on the difference of pixels between low-resolution whole picture data of the current frame and background picture data of the  
10 last frame;

a background picture updating unit which adds the unchanged non-object region to the background picture data, for updating;

a prediction failure detection unit which  
15 compares high-resolution partial picture data acquired at the current frame with low-resolution whole picture data at the extracting position accumulated in the last frame, the prediction failure detection unit if the two pictures differs  
20 from each other, removing the noted object from the detected object picture of the last frame;

a noted position detection unit which selects an undetected noted object through the comparison of the object region data with the detected object  
25 picture data, to determine a noted position, the noted position detection unit adding the selected object to the detected object picture data, for



updating; and

an extracting position determination unit which predicts a noted position of the next frame based on a motion model obtained from the frame history of the selected noted object, to determine  
5 the extracting position of the next frame.

10. The picture inputting apparatus according to claim 1, wherein

10 the image processing unit determines the extracting position of a high-resolution partial picture based on the execution of an image processing program externally loaded and retained or on an external instruction.

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11. The picture inputting apparatus according to claim 1, further comprising:

a picture transmission unit which converts into analog picture signals low-resolution whole  
20 picture data output from the low-resolution whole picture scanning unit and high-resolution partial picture data output from the high-resolution partial picture scanning unit, to transmit the obtained analog picture signals to an external  
25 image processor via a transmission path.

12. The picture inputting apparatus according

to claim 11, wherein

the picture transmission unit converts the  
low-resolution whole picture data and the  
high-resolution partial picture data into analog  
5 picture signals, respectively, for parallel  
transmission.